WHAT IS CLAIMED IS:

1   1. A method for controlling the sampling of addressed data, the method

2   comprising:

3   a) determining a state of next hop information defining a destination for

4   samples of addressed data;

5   b) if it is determined that the state of the next hop information is stable,

6   then

7   i) generating samples from the addressed data, and

8   ii) forwarding the samples based on the next hop information; and

9   c) if it is determined that the state of the next hop information is not

10   stable, then not forwarding samples.

1   2. The method of claim 1 wherein the act of not forwarding samples includes

2   dropping samples generated.

1   3. The method of claim 1 wherein the act of not forwarding samples includes

2   suppressing sample generation.

1   4. The method of claim 1 wherein the addressed data are packets.

1   5. The method of claim 1 wherein the next hop information includes an index or

2   name associated with an interface.

1   6. The method of claim 5 wherein a link terminated by the interface defines a

2   point-to-point connection with a sample destination device.

1   7. The method of claim 1 wherein the next hop information is associated with an

2   interface.

1   8. The method of claim 7 wherein a link terminated by the interface defines a

2   point-to-point connection with a sample destination device.

1   9. The method of claim 1 wherein the next hop information is associated with a

2   next hop destination address.

1   10. The method of claim 1 wherein the act of determining a state of next hop

2   information defining a destination for samples of addressed data includes reading

3   a state flag.

1   11. The method of claim 10 wherein the state flag is stored in a hardware

2   register.

1   12. The method of claim 1 wherein the act of generating samples from the

2   addressed data is performed based on parameters.

1   13. The method of claim 12 wherein the parameters are user configured.

1   14. The method of claim 13 wherein the parameters include at least two

2   parameters selected from a group of parameters consisting of (a) sampling rate,

3   (b) class to be sampled, (c) protocol to be sampled, and (d) run length.

1   15. The method of claim 1 further comprising:

2   d) counting some parameter of samples forwarded.

1   16. A method for maintaining information used to control the sampling of

2   addressed data, the method comprising:

3   a) determining a state of next hop information defining a destination for

4   samples of addressed data; and

5   b) if it is determined that the state of the next hop information is unstable,

6   then ensuring that information used to control the sampling of addressed

7   data indicates that the next hop information is unstable.

1   17. The method of claim 16 further comprising:

2   c) if it is determined that the state of the next hop information is stable,

3   then ensuring that the information used to control the sampling of

4   addressed data indicates that the next hop information is stable.

1   18. The method of claim 16 wherein the information used to control the sampling

2   of addressed data is stored in a hardware register.

1   19. The method of claim 16 wherein the information used to control the sampling

2   of addressed data includes next hop information and next hop state information.

1   20. The method of claim 19 wherein the next hop information includes an index

2   or name associated with an interface.

1   21. The method of claim 20 wherein a link terminated by the interface defines a

2   point-to-point connection with a sample destination device.

1   22. The method of claim 19 wherein the next hop information is associated with

2   an interface.

1   23. The method of claim 22 wherein a link terminated by the interface defines a

2   point-to-point connection with a sample destination device.

1   24. The method of claim 19 wherein the next hop information includes a next

2   hop destination address.

1   25. The method of claim 16 wherein the addressed data are packets.

1   26. A method for maintaining information used to control the sampling of

2   addressed data, the method comprising:

3   a) accepting configured next hop information;

4   b) determining next hop interface information from the accepted

5   configured next hop information;

6   c) determining a state of the next hop interface information; and

7   d) storing the determined next hop interface information and the state of

8   the next hop interface information.

1   27. The method of claim 26 wherein the next hop interface information is an

2   index or name associated with an interface of a router.

1   28. The method of claim 26 wherein the next hop interface information is an

2   index or name associated with a logical interface of a router.

1   29. The method of claim 26 wherein the act of determining next hop interface

2   information from the accepted configured next hop information uses information

3   in an interface list of a router.

1   30. The method of claim 26 wherein the act of determining a state of the next

2   hop interface information uses information in a forwarding table of a router.

1   31. The method of claim 26 wherein the act of storing the determined next hop

2   interface information and the state of the next hop interface information includes

3   writing the next hop interface information and the state of the next hop interface

4   information into at least one hardware register.

1   32. A machine-readable medium having machine-readable data structures

2   stored thereon, the machine readable data structures comprising:

3   a) at least one parameter for controlling the sampling of addressed data;

4   b) information identifying a next hop destination of samples of addressed

5   data; and

6   c) information identifying a state of the information identifying a next hop

7   destination of samples of addressed data.

1   33. The machine-readable medium of claim 32 further comprising:

2   d) a forwarding table.

1   34. The machine-readable medium of claim 33 wherein the forwarding table

2   includes a plurality of entries, each of the plurality of entries including a next hop

3   index and a next hop interface.

1   35. The machine-readable medium of claim 34 wherein each of the plurality of

2   entries of the forwarding table further includes a next hop address.

1   36. In an addressed data forwarding device, apparatus comprising:

2   a) a storage device for storing

3   i) next hop information defining how samples generated from

4   addressed data are to be forwarded, and

5   ii) an indicator for indicating a state of the next hop information;

6   and

7   b) a sampling facility for generating samples from the addressed data and

8   for forwarding the generated samples based on the next hop information,

9   wherein, if the indicator indicates that the state of the next hop

10   information is not stable, then the sampling facility will not generate and forward

11   samples.

1   37. The apparatus of claim 36 wherein the storage device is a hardware register.

1   38. In an addressed data forwarding device, apparatus comprising:

2   a) a storage device; and

3   b) a sampling control facility for determining a state of next hop

4   information defining a destination for samples of addressed data, and

5   storing, in the storage device, an indicator of whether or not the state of

6   next hop information is stable.

1   39. The apparatus of claim 38 wherein the storage device is a hardware register.

1   40. The apparatus of claim 38 further comprising:

2   c) a sampling facility for generating samples from the addressed data and

3   for forwarding the generated samples based on the next hop information,

4   wherein, if the indicator indicates that the state of the next hop information

5   is not stable, then the sampling facility will not generate and forward

6   samples.

1   41. The apparatus of claim 39 wherein the sampling facility is an integrated

2   circuit.

1   42. An addressed data forwarding device comprising:

2   a) a first storage device for storing forwarding information;

3   b) a forwarding facility for forwarding addressed data based on

4   information in the addressed data and based on forwarding information

5   stored in the first storage device;

6   c) a second storage device for storing

7   i) next hop information defining how samples generated from

8   addressed data are to be forwarded, and

9   ii) an indicator for indicating a state of the next hop information;

10   and

11   d) a sampling facility for generating samples from the addressed data

12   forwarded by the forwarding facility and for forwarding the generated

13   samples based on the next hop information,

14   wherein, if the indicator indicates that the state of the next hop

15 information is not stable, then the sampling facility will not generate and forward

16 samples.

1   43. The addressed data forwarding device of claim 42 wherein the second

2 storage device is a hardware register.

1   44. An addressed data forwarding device comprising:

2   a) a first storage device for storing forwarding information;

3   b) a forwarding facility for forwarding addressed data based on

4   information in the addressed data and based on forwarding information

5   stored in the first storage device;

6   c) a second storage device; and

7   d) a sampling control facility for determining a state of next hop

8   information defining a destination for samples of addressed data, and

9   storing, in the storage device, an indicator of whether or not the state of

10   next hop information is stable.

1   45. The addressed data forwarding device of claim 44 wherein the storage

2 device is a hardware register.

1   46. The addressed data forwarding device of claim 44 further comprising:

2   e) a sampling facility for generating samples from the addressed data and

3   for forwarding the generated samples based on the next hop information,

4   wherein, if the indicator indicates that the state of the next hop information

5   is not stable, then the sampling facility will not generate and forward

6   samples.

1   47. The addressed data forwarding facility of claim 46 wherein the sampling

2 facility and forwarding facility are defined by an integrated circuit.